



## **Katadyn – Base Camp**

[www.katadyn.com](http://www.katadyn.com)

### **Device Information**

The Katadyn Base Camp is a gravity feed water treatment device utilizing glass fiber microfiltration. This device is identical to the Katadyn Camp except for the type of filtration element used. Containing what the manufacturer terms “AntiClog Technology”, the device consists of 129 square inches of pleated 0.3  $\mu\text{m}$  glass fiber media, with an activated carbon core. This device creates an absolute barrier to contaminants greater than the pore size and may remove taste and odor through carbon filtration. This device is designed for bacteria and cyst reduction, but contains no reduction mechanism for virus. The manufacturer recommends a chemical disinfectant be added if virus is suspected in the water source. The device consists of a 10 L water bag, glass fiber filter element, outlet tubing, and tubing clamp. The filter element used in this device is identical to the Katadyn Hiker Pro, and contains a washable filter cover to reduce the clogging effect when filtering turbid waters. No chemicals and no wait time are required for use. To use, water is poured or scooped into the bag, then the bag is hung above the ground surface and allowed to produce by gravity flow. The greater the distance in elevation between the water surface in the bag and the end of the outlet tubing, the greater the production rate. Prior to first use, and after prolonged storage, the manufacturer recommends discarding a small amount of water to reduce stale taste. This device is field serviceable, and can be disassembled without tools. The filter protector can be removed and cleaned as often as necessary, but the filter element cannot be cleaned and must be discarded once clogged. The filter protector supplies an extra barrier to extend the microfilter life by reducing particulate matter, but it is unlikely to increase microbial pathogen reduction.

### **Effectiveness Against Microbial Pathogens**

Independent laboratory results were received challenging a similar device, the Katadyn Hiker (tested under a previously brand name), against a modified version of the U.S. Environmental Protection Agency (USEPA) Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1). Since the Base Camp device utilizes the same filter element as the Hiker, results for the Hiker are considered representative of those expected for the Base Camp. Results for bacteria challenge showed reduction of > 6-log or just under 6-log based on geometric averages of samples collected (references 2, 3). Data collected for *Cryptosporidium* reduction met the > 3-log reduction requirement of reference 1 (references 2, 3). Since the primary reduction mechanism is size exclusion, and because *Giardia* cysts are larger in size than *Cryptosporidium* oocysts, similar results for *Giardia* reduction can be assumed. This device is

not designed for virus reduction and therefore, no data was reviewed for reduction of this pathogen. This device is assigned one √ for bacteria and cyst reduction (for an explanation of the rating checks [click here](#)) based on size exclusion by the glass microfilter. Since the device is not designed, and has no mechanism, for virus reduction, the device is assigned one X for this pathogen.

**Table. Expected Performance Against Microbial Pathogens.**

Microbial Pathogen Type	Expected Disinfection Capability	Evaluation Rating	Pathogen Reduction Mechanism
Bacteria	> 6-log	√	size exclusion
Viruses	not effective*	X	none
<i>Giardia</i> cysts	> 3-log	√	size exclusion
<i>Cryptosporidium</i> oocysts	> 3-log	√	size exclusion

\* additional treatment required for virus reduction.

#### Production Rate and Capacity

Inherent to the production rate and capacity of filtration devices is the quality of the raw water source. The manufacturer stated production capacity of the device is 750 L at a rate of 0.5 L/min. This device utilizes a glass depth microfilter. The filter cannot be backwashed, and once clogged must be replaced. If clogged, a small amount of water may be produced if the filter is removed and swished in water (raw water acceptable). The filter protector is expected to extend the life of the microfilter, but clogging will likely still occur, dependent upon the raw water quality. The filter protector is a removable coarse material that can be scraped clean and swished in water to remove particulates. The capacity of this device will vary widely with raw water turbidity.

#### Cleaning, Replacement, and End of Life Indicator

This device cannot be backwashed to remove sediment from the filter. When the device becomes unusable due to decreased production rate, the clogged filter must be replaced. The filter protector can be removed, cleaned and reused. The device contains no end of life indicator short of filter clogging. Since the device works solely on size exclusion, as long as the device will process water, stated pathogen reductions should be valid. The carbon core will eventually



become exhausted. Since little or no pathogen reduction is attributed to the carbon core, if it were to be exhausted prior to clogging of the microfilter, microbial reduction should be unchanged. No data was presented to determine the capacity of the carbon core.

#### Weight and Size

Katadyn Base Camp	370 grams
Size (height x diameter)	19 cm x 10 cm
Tubing	91 cm

#### Cost

Katadyn Camp	\$60.00
Replacement glass fiber element	\$35.00

#### Device Evaluation

The Katadyn Base Camp utilizes a 0.3  $\mu\text{m}$  glass microfilter and carbon core for the reduction of bacteria, and cysts, as well as taste and odor. Independent data for the Katadyn Hiker utilizing the same filter element, showed reduction of bacteria and cysts to within the requirements of reference 1, or by  $> 6\text{-log}$  and  $> 3\text{-log}$ , respectively, based on a modified version of the protocol. Inconsistent reduction of bacteria, with one test not meeting the required  $> 6\text{-log}$  reduction, as well as testing procedures not strict to the USEPA protocol, warrants the assignment of one check each for reduction of cysts and bacteria. This rating states that, due to the device technology, expert opinion believes that the device should be able to meet the bacteria and cyst reduction requirements of reference 1 (reference 4). More independent laboratory data is necessary to confirm these reductions. Since the device reduction mechanism is size exclusion by means of a 0.3  $\mu\text{m}$  microfilter, no virus reduction is claimed by the manufacturer. Additional treatment is required to fully meet the requirements of reference 1 and ensure adequate reduction of all three classes of microorganism. This device, like all filters with small pore sizes, is highly affected by turbid (cloudy) waters. This device utilizes no chemicals and requires no wait time prior to water consumption. There is no indicator of process failure or end of device useful life except filter clogging or the user keeping track of the volume of water produced. Since this device operates off of gravity, use is restricted to stationary scenarios, or when able to hang device during movement, such as inside a vehicle. Flowrate of the device will change with the amount of water in the bag (head) as well as with the elevation change from water surface in bag compared to outlet tubing elevation. No manufacturing information or quality control data was received for this device. The manufacturer states ISO 9000 certification. No information was received on the storage life or required storage conditions for this device.



### Advantages

- Based on treatment technology and limited independent data reviewed, this device should be capable of reducing bacteria and cysts to within the requirements of the USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1).
- No wait time prior to water consumption.
- Activated carbon core should reduce taste and odors.
- Passive device requiring no user input.
- Simple and lightweight.

### Disadvantages

- Device is not designed for virus reduction and therefore unable to fully meet the pathogen reduction requirements of the USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1).
- Additional treatment required.
- Small pore size of filter makes device inherently susceptible to clogging by waters with elevated turbidities.
- Device unable to be backwashed.
- No real-time indicator of process failure.
- Device requires hanging and cannot be used on the move on foot.

### References

1. USEPA, 1989. Guide Standard and Protocol for Testing Microbiological Water Purifiers. *Federal Register*. 54:34067.
2. Independent laboratory results of tests showing bacteria and cyst reduction, 1996. Provided by Katadyn.
3. Independent laboratory results of tests showing bacteria and cyst reduction, 1995. Provided by Katadyn.
4. U.S. Army Center for Health Promotion and Preventive Medicine, 2005. *Technical Information Paper; Filtration in the Use of Individual Water Purification Devices*, Aberdeen Proving Ground, MD.

